

ABSTRACT

Solar Grade Silicon is produced by decomposition of a silicon precursor, preferably trichlorosilane, in the presence of an excess of hydrogen gas, where the reactant are introduced in a reaction chamber whose lower portion is held at a temperature above the melting point of silicon and whose upper portion is held at ambient temperatures. The method is distinguished by the introduction of trichlorosilane through a feed pipe which is arranged coaxially inside an outer pipe for introducing hydrogen gas that functions as a cooling medium for the introduced fluid trichlorosilane. The silicon formed is collected in the lower portion of the reactor and removed through an outlet. Excess hydrogen and hydrogen chloride is withdrawn through an outlet and can, after purification, be used as reactants in the essentially closed system for the production of pure silicon from low grade silicon. Silicon particles in the off gases can be separated, melted and recycled using a particle recapture tower.